UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,844	08/25/2003	Yi-Liang Lu	3079/186	1458

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ART UNIT	PAPER NUMBER
2629	

DATE MAILED: 05/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/631,884	TAUBMAN, DAVID S.
	Examiner	Art Unit
	Wenpeng Chen	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>*17 March 2006*</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10 and 12-18* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10, 12-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Examiner's Remarks

1.   Applicant's amendments filed on 3/17/06 overcome the following set forth in paper #20051207 mailed on 12/192005:

-- objection to claims (paragraph 2.)

2.   Applicant's terminal disclaimer filed on 3/17/06 overcome the following set forth in paper #20051207 mailed on 12/192005:

-- rejection to Claims 1-5 and 12-18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 6,658,159);

-- rejection to Claims 6-10 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 6,658,159 in view of JPEG2000.

3.   Applicant's declaration under 37 CFR 1.131 filed on 3/17/06 disqualifies (1) "JPEG 2000 IMAGE CODING SYSTEM," JPEG 2000 Final committee draft version 1.0, 16 March 2000" and (2) Budge et al. (US Patent Application Publication 2002/0080408) as prior art. As a consequence, the Examiner withdraws the following set forth in paper #20051207 mailed on 12/192005:

-- rejections to Claims 1-10 and 12-18 under 35 U.S.C. 102(a) as being anticipated by "JPEG 2000 IMAGE CODING SYSTEM," JPEG 2000 Final committee draft version 1.0, 16 March 2000";

-- rejections to Claims 1-10 and 12-18 under 35 U.S.C. 103(a) as being unpatentable over

the admitted prior art (pages 2-3, last paragraph in page 7) in view of Schwartz et al. (US patent

5,815,097) and Budge et al. (US Patent Application Publication 2002/0080408.)

4.   A new ground of rejection is provided below. This Action is made non-final due

to the declaration under 37 CFR 1.131.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that
> the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary
> skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

6.   Claims 1-10 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable

over the admitted prior art (pages 2-3, last paragraph in page 7) in view of Christopoulos et al.

(WO 99/16250.)

a.   With regard to Claims 1-10, the admitted prior art (pages 2-3) disclosed the JPEG

2000 algorism that teaches method and system for compressing image data, comprising the

steps/components for:

-- decomposing the image data into code-blocks of coefficients using a transform, each

code-block comprising a plurality of bit-planes from a most significant bit-plane to a least

significant bit-plane; (page 3)

-- forming an encoded bit-stream by coding bit-planes of coefficient data in the code-

blocks according to an arithmetic coding scheme in order to form an encoded bit-stream; (page

3)

-- wherein the arithmetic coding scheme operates in a plurality of coding passes; (page 3;

Each coding of a bit plane is a pass.)

-- wherein the method for compressing image data is based on embedded block coding

with optimized truncation and employs a Wavelet transform. (The last paragraph in page 7 of the

present specification admitted that EBCOT is a prior art as published in the document N 1020R

on 10/21/1998.)

The system cited in JPEG 2000 Image Coding System document (page 2) implicitly

teaches all components to implement the above features.

However, the admitted prior art does not teach the feature that "coefficient data from at

least one bit-plane is included in the encoded bit-stream without arithmetic coding."

Christopoulos teaches a compression system and method:

-- coefficient data from at least one bit-plane is included in the encoded bit-stream

without arithmetic coding. (last paragraph, page 2; paragraph 2, page 3; paragraph 1, page 9;

paragraphs 2 and 5, page 11; Fig. 2; The coding is done in a bit-plane basis and applicable to

wavelet transformed coefficients. The raw bits are included in the encoded bit-stream without

arithmetic coding because there is little to gain. Fig. 2 shows that there are 4 rawbits in the LSB

side.)

It is desirable for reducing unnecessary coding operations to simplify and speed up

coding process. It would have been obvious to one of ordinary skill in the art, at the time of the

invention, to apply Christopoulos' teachings to bypass arithmetic coding of the K least

significant bit-planes of the data taught in the admitted prior art, because the combination

provides an advantage of reducing the entropy coding operations. Accordingly, the combination

teaches:

-- wherein the arithmetic coding scheme operates in a plurality of coding passes, and

wherein at least one of the arithmetic coding passes for the coefficient data from said at least one

bit-plane is not performed during the image data compression;

-- wherein coefficient data from bit-planes $p < po-K$ are written directly into the encoded

bit-stream without arithmetic coding, wherein po denotes the most significant bit-plane of the

code block in which any sample therein becomes contextually significant during arithmetic

coding and K is an integer parameter; (In the combination, the N-K bit-planes are arithmetic

coded.)

- wherein K includes 3, (It is well known that a pixel usually has 8 bits. Schwartz teaches

in column 11, lines 21-27 that three or four entropy coding operations are performed on the

amplitude data.)

The combinations as cited above also teach the system Claims 6-10.

b.   With regard to Claim 12, because (1) each code-block taught in the admitted prior

art is coded and transmitted one by one and (2) the combination teaches coding each code-block

with and without arithmetic coding, the combination also teaches the feature that arithmetically

coded bit-plane data is interleaved with the bit plane coefficient data included in the bit-stream

without arithmetic coding.

c.   With regard to Claims 13-18, the admitted prior art (pages 2-3) disclosed the

JPEG 2000 algorism that teaches method and system for compressing image data, comprising the

steps/components for:

-- decomposing the image data into code-blocks of coefficients using a transform, each

code-block comprising a plurality of bit-planes from a most significant bit-plane to a least

significant bit-plane; (page 3)

-- processing bit-planes of coefficient data in the code blocks in multiple coding passes to

generate raw bit-plane data; (page 3; block 22 of Fig. 1; Each coding of a bit plane is a pass.)

-- coding bit-planes of coefficient data in the code-blocks according to an arithmetic

coding scheme in order to form an encoded bit-stream; (page 3)

-- wherein the arithmetic coding scheme operates in a plurality of coding passes; (page 3;

block 22 of Fig. 1.)

-- wherein the method for compressing image data is based on embedded block coding

with optimized truncation and employs a Wavelet transform. (The last paragraph in page 7 of the

present specification admitted that EBCOT is a prior art as published in the document N 1020R

on 10/21/1998.)

The system cited in JPEG 2000 Image Coding System document (page 2) implicitly

teaches all components to implement the above features.

However, the admitted prior art does not teach the recited features related to (1) "the step

of coding a portion of raw bit-plane data" and "the step of writing coded data and raw data not

arithmetic coded into a bit-stream."

Christopoulos teaches a compression system and method:

-- coefficient data from at least one bit-plane is included in the encoded bit-stream

without arithmetic coding. (last paragraph, page 2; paragraph 2, page 3; paragraph 1, page 9;

paragraphs 2 and 5, page 11; Fig. 2; The coding is done in a bit-plane basis and applicable to

wavelet transformed coefficients. The raw bits are included in the encoded bit-stream without

arithmetic coding because there is little to gain.)

It is desirable for reducing unnecessary coding operations to simplify and speed up

coding process. It would have been obvious to one of ordinary skill in the art, at the time of the

invention, to apply Christopoulos' teachings to bypass arithmetic coding of the K least

significant bit-planes of the data taught in the admitted prior art, because the combination

provides an advantage of reducing the entropy coding operations. Accordingly, the combination

teaches:

-- arithmetically coding a portion (the most-significant-bit bit-planes) of raw bit-plane

data to generate arithmetically coded data;

-- writing the arithmetically coded data and the raw bit-plane data not arithmetically

coded (K least-significant-bit bit-planes) directly into a bit-stream, wherein these two data are

interleaved; (Because (1) each code-block taught in the admitted prior art is coded and

transmitted one by one and (2) the combination teaches coding each code-block with and without

arithmetic coding, the combination also teaches the feature that arithmetically coded bit-plane

data is interleaved with the bit plane coefficient data included in the bit-stream without arithmetic coding.)

-- wherein raw bit-plane data generated during at least one coding pass for a prescribed class (the class of least-significant-bit bit-planes) of bit-planes is written directly into the bit-stream;

-- wherein raw bit plane data generated during at least one coding pass for bit-planes $p < po-K$ is written directly into the encoded bit-stream, wherein po denotes the most significant bit-plane of the code block in which any sample therein becomes contextually significant during arithmetic coding and K is an integer parameter; (In the combination, the N-K bit-planes are arithmetic coded in the amplitude coding pass.)

- wherein K includes 3. (It is well known that a pixel usually has 8 bits. Schwartz teaches in column 11, lines 21-27 that three or four entropy coding operations are performed on the

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wenpeng Chen whose telephone number is 571-272-7431. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 571-272-7453. The fax phone numbers for the organization where this application or proceeding is assigned are 571-273-8300 for regular

communications and 571-273-8300 for After Final communications. TC 2600's customer service

number is 571-272-2600.

    Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is 571-272-2600.

Wenpeng Chen
Primary Examiner
Art Unit 2624

May 22, 2006